Conditionals
Agenda

1. Recap
2. Conditional Statements
3. Boolean Expressions
   a. Booleans
   b. Logical Operators
   c. Relational Operators
4. More Conditionals
   a. Else If
   b. Not
   c. Nested Statement
RECAP

- Variables
- Functions
- Pseudocode
- setup() and draw()
RECAP

Variables

Functions

Processing IDE
Live Code: Using Variables

- Use color changer variables that paint bubbles with different colors
Show us your code art.

- Team Labs https://borderless.teamlab.art/ko/
- The Green Eyl http://thegreeneyl.com/5670
- Munkowitz: https://gmunk.com/BOX
- http://ravenkwok.com
- http://dillonbaker.com/#/spectrum/
- https://www.youtube.com/watch?v=iV-hah6xs2A
- http://www.playmapscube.com/
- http://ravenkwok.com/build-the-cities/
- https://vimeo.com/237387292
- https://vimeo.com/121096680
Show us your code art.

- https://www.youtube.com/watch?v=rn6gR1R0xUk
- https://www.openprocessing.org/sketch/453716
- https://interview.ueno.co/
- https://alimurtaza.net/Perceptive-Objects-MFA-Thesis
- https://frm.fm/a/refik_anadol/engram_specialEdition_a
- http://designcollector.net/likes/melting-memories-by-refik-anadol
Conditionals
Conditionals as Grammar of what can be said
if this then that

- Trigger
- Action
If I am hungry, then I will eat the food.
If I am hungry, then I will eat the food.

Otherwise (else), I will not eat.
If I am hungry, then I will eat the food.
Otherwise, I will not eat.
If I am hungry, then I will eat the food.
Otherwise ("else"), I will not eat.
Conditionals lead to a flow chart representation.

Grammar of language
Booleans

True or False
Boolean Variables

boolean isHungry = true;
if (isHungry) {
    // “I will eat the food”
}
else {
    // “I will not eat”
}
Logical Operators
If I am thirsty and I feel hot, I will drink cold water.
if (isThirsty && isHot) {
    // if “thirsty” AND “hot” are both true, do the following:
    // “I will drink cold water”
}

if (isThirsty && isCold) {
    // if “thirsty” AND “cold” are both true, do the following:
    // “I will drink hot tea”
}

// Note: if one is true and the other is false, then the if statement will not run
If I am tired or it is late, I will go to sleep.
if (isTired || isLate) {
    // if “tired” is true or “late” is true, then do the following:
    // “I will go to sleep”
}

// Note: if one is true and the other is false, then the if statement will still run
AND logic

OR logic
Relational Operators
<table>
<thead>
<tr>
<th>Operator</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;</code></td>
<td>“less than”</td>
<td>if (x &lt; 10) { //do something }</td>
</tr>
<tr>
<td><code>&lt;=</code></td>
<td>“less than or equal to”</td>
<td>if (x &gt;= 15) { //do something }</td>
</tr>
<tr>
<td><code>&gt;</code></td>
<td>“greater than”</td>
<td>if (x &gt; 3) { //do something }</td>
</tr>
<tr>
<td><code>&gt;=</code></td>
<td>“greater than or equal to”</td>
<td>if (x &gt;= 7) { //do something }</td>
</tr>
<tr>
<td><code>==</code></td>
<td>“equal to”</td>
<td>if (x == 18) { //do something }</td>
</tr>
</tbody>
</table>
== VS. =
==

(Check equality)

Double equal sign compares two values and returns true if they are equal.

Asks a question

if (x == 10) {
    // do this
}

"Is x equal to ten?"

=

(Assign)

Single equal sign sets a variable equal to a value.

Does not ask a question

x = 32;

"Set x equal to 32."
CORRECT

if(x == 10){
    if(x = 10){
        // do this
        // do this
    }
}

INCORRECT
Exercise: Boolean Expressions

- With a partner, write down questions that will serve as the condition of different results, and use logical operators or relational operators to rewrite these questions.

Is 2 equal to 2? (2 == 2)
   true

Is 5 less than 8? (5 < 8)
   true

Is 5 greater than 10? (5 >= 10)
   false
Show your pseudocode.

- crazy ass pseudocode
- self introduction.
int grade = 86;

if (grade >= 90) {
    // "Your grade is an A"
} else if (grade >= 80) {
    // "Your grade is a B"
} else if (grade >= 70) {
    // "Your grade is a C"
} else if (grade >= 60) {
    // "Your grade is a D"
} else {
    // "Fail"
}
int grade = 86;

if (grade >= 60) {
    // "Your grade is a D"
} else if (grade > 70) {
    // "Your grade is a C"
} else if (grade > 80) {
    // "Your grade is a B"
} else if (grade > 90) {
    // "Your grade is a A"
} else {
    // "Fail"
}
```java
int grade = 86;

if(grade >= 60 && grade < 69){
    println("Your grade is an D");
} else if (grade > 70 && grade < 79) {
    println("Your grade is an C");
} else if (grade > 80 && grade < 89) {
    println("Your grade is an B");
} else if (grade > 90 && grade <= 100) {
    println("Your grade is an A");
} else {
    println("Fail");
}
```
Exercise: A Bouncing Ball Problem

- With a partner, write down the pseudocode of Processing drawing a ball on the screen
- Go through the process and think of the conditionals that will be involved when the ball hits the edge
- Make the ball bounces back when hitting the edge

- Live code
NOT Operator
int x = 10;

boolean isEqualTen = (x == 10);
boolean b = true;

if (isEqualTen && b) {
    // do this
}

// same as...
if (isEqualTen == true && b == true) {
    // do this
}
int x = 10;

boolean isEqualTen = (x == 10);
boolean b = false;

if (isEqualTen && !b) {
    // do this
}


int x = 10;

boolean isEqualTen = (x == 10);
boolean b = true;

if (isEqualTen == true) {
    if (b == true) {
        // action if x equals to 10 and b is true
    } else {
        // action if x equals to 10 and b is not true
    }
} else {
    if (!b == true) {
        // action if x does not equal to 10 and b is not true
    } else {
        // action if x does not equal to 10 and b is true
    }
}
Flow Chart
Start

End

Process

Input/Output

Conditional Judgment

No

Yes
lamp doesn’t work

- lamp plugged in?
  - no: plug in lamp
  - yes: bulb burned out?
    - yes: replace bulb
    - no: buy new lamp
Homework

Make a flowchart!

Ideas:

- Think of an important decision
- Examples: expiration date on milk, how to cross the street
- Inspiration

Try not to plan out the result - instead, let the look happen naturally with exploration!
Midterm - Text Adventure

Also known as Interactive Fiction.
Conveys a game’s story through the use of text.
Player utilizes typed instructions as the response
Content/storyline is the key
Due Tomorrow - write a story and draw the flowchart of different stages

Examples: http://www.rayl.c.org/utophi.n/utophi.n.html